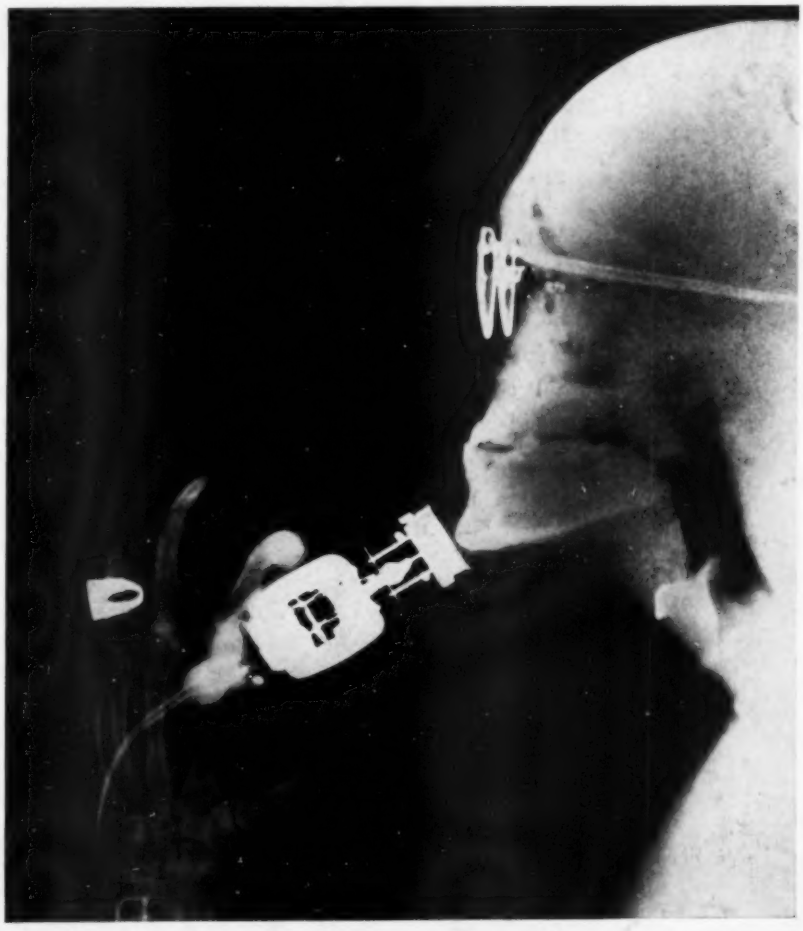
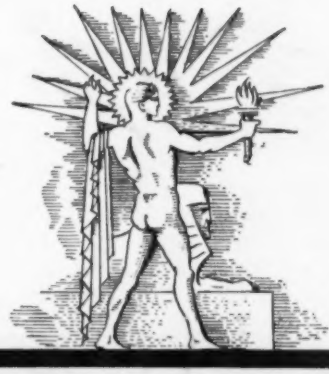
SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





March 29, 1941

He Had a Close Shave

See Page 201

A SCIENCE SERVICE PUBLICATION

Do You Know?

One child in eight in the United States is born without *medical attention*, statistics show.

WPA workers will compile *bibliographies* of the Polar regions useful to the U. S. Army Air Corps.

A full-sized *sneeze*, says a scientist, who has photographed all types, rarely lasts more than a tenth of a second.

A new method of checking the *borer* pests in peach trees is to use ethylene dichloride and potash fish-oil soap diluted.

In caring for *marble statues*, ancient Greeks are said to have rubbed wax candles on the marble, then polishing with linen.

Stuttering is most likely to develop in children in the fifth grade at school—about 11 years of age—says a university speech teacher.

Bombs are painted in order to prevent rust and reduce air resistance and to enable the pilot of the bombing plane to watch their fall.

If *traffic* on highways in the United States should double, two-lane width would still be adequate for 98% of the roads, says one road official.

Egypt was not "Egypt" to its ancient people; the name was given by the Greeks, and Egyptians themselves called their land Kem or by other names.

QUESTIONS DISCUSSED IN THIS ISSUE

Most articles which appear in SCIENCE NEWS LETTER are based on communications to Science Service, or on papers before meetings. Where published sources are used they are referred to in the article.

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RESOURCES—MEDICINE
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SEISMOLOGY
How may the earth give warning of an approaching quake? p. 195.

ZOOLOGY
Where are the only living albatrosses in captivity? p. 200.

Hollow wooden *cones* are used by islanders in the South Pacific as receptacles for catching and storing the souls of men at death.

In the new War Department Building being built at Washington, government *records* will be protected against dirt by electrically cleaning the air.

A deaf Scotsman in Glasgow *salvages* used batteries from hearing aids to produce copper for shells, carbon for bayonet steel and other war goods.

Drought resistance in *corn* is inherited.

Chippewa Indians in Minnesota harvest a 1,500,000 pound crop of *wild rice* a year, now that white men have popularized this Indian delicacy.

Proof that large *bombing planes* can use frozen Arctic lakes to land on was afforded recently when a U. S. Army Flying Fortress carried 600 pounds of dried salmon to Alaskan dog teams on an Army trek, and the plane made a wheel landing on glare ice.

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SEISMOLOGY

Tiny Grinding Noises Made In Earth May Warn of Quake

New Seismic Recorder Makes It Possible To Measure, Record and Classify Noises From Fault Line Movements

WITH a new instrument known as a seismic recorder, scientists can now tune in on an earthquake's "voice." Government seismologists in Oakland, Calif., have made the surprising discovery that the weird, rumbling sounds which precede certain kinds of earth shocks can be measured, and that they have frequencies very much like those heard in the commercial broadcast channels.

Even more important—the rumbling sounds can be classified, and after further study, doubtless will be useful in giving warning of approaching earthquakes.

What makes these noises? Most seismologists believe that extremely small movements, accompanied by barely recordable grinding noises, are taking place at various points along a fault line before a major earthquake occurs.

The seismic recorder was developed after many months of experimentation by scientists of the U. S. Coast & Geodetic Survey, the nation's official fact-finding body for earth shocks, with headquarters in Washington. It provides an automatic 14-day record. Changes in earth sounds from day to day are continuously and permanently recorded by a mechanical pen which makes marks on a moving roll of paper attached to a recording drum.

At the present time several of the recorders are in daily operation along the famous Hayward fault (large crack in the earth's surface caused by earthquakes), which is on the east side of San Francisco Bay. It runs through Oakland, all the way to the lower end of the Santa Clara Valley, and is at least 100 miles long.

This particular section of California was chosen to test the new instrument for two reasons, first, because it contains a number of wells, which provide ideal testing places for special microphones used with the recorders, and secondly because this is one of the nation's major earthquake centers.

During the past 60 years there have been some four large quakes in the immediate vicinity. One in 1868 took place to the south of Oakland. It was highly destructive and several deaths occurred from falling bricks. Twenty years later another shock struck Oakland, resulting in moderate damage and no loss of life. In 1903 a less severe tremor shook the region but did very little property damage. Another minor quake took place at Niles Canyon, just south of Oakland, in 1933.

The seismic recorder was built by A. M. Vincent, radio technician of the Coast & Geodetic Survey. Lightweight and portable, it is readily transferable from one earthquake region to another. Just before an earthquake occurs the device works as follows: the characteristic warning sounds of the approaching tremor are picked up by two microphones placed in wells about 300 feet deep. Permanent records of the sounds are made by a seismic recorder located at the surface of the ground near the top of the well. These sounds are then classified by the local seismologist and sent to Washington for further study. Within a few months it is hoped that a "musical library" of earthquake noises will be gathered together so that soon men may learn at least several days in advance of an impending quake.

Probably the next decade will develop more scientifically valuable information about earthquakes than has been evolved during past centuries, according to Captain N. H. Heck, in charge of seismological work for the U. S. Coast and Geodetic Survey. Doubtless, he says, there are many more thousands of quakes than are recorded on the seismographs of today. Approximately 10,000 earth tremors, major or minor, mostly of very slight intensity, are recorded yearly by the seismological stations now operating throughout the world.

With the help of the new recorder and with maps showing activity of earthquakes along the fault lines, it may be practicable, points out Captain Heck, to make predictions as to liability of occurrence of cataclysms in a given large area within a fixed but extended period of time.

Science News Letter, March 29, 1941

MAY WARN OF QUAKES

Dr. Dean S. Carder, seismologist of the U. S. Coast and Geodetic Survey, makes an adjustment of the new seismic recorder, which registers by a pen on the drum to the right the slight noises made in the ground by potential earth tremors.

ENGINEERING

Bombing Planes Being Built In Automobile Factories

Details of Program for Apportioning Manufacture of Parts and Assemblies for Defense Is Made Public

DETAILS of the program by which the automobile industry will build bombing planes for the U. S. Army, in addition to other defense work, including 13,000 military vehicles now being turned out monthly, were given at the National Aeronautic Meeting of the Society of Automotive Engineers in Washington.

C. C. Carlton, managing director of the Automotive Committee for Air Defense, told the engineers that, in a four months' study, facilities of 800 factories have been surveyed for their possible contributions to the program. Three bombers are to be built. One is the B-24D, a four-motor craft now constructed by Consolidated Aircraft Corporation. Another is the two-motored B-25, of the North American Aviation Company, and the third the two-motored B-26, of the Glenn L. Martin Company.

The Ford Motor Company has been allocated production of parts and assemblies of the B-24D. These will be shipped to two Army-owned assembly plants, one at Ft. Worth, Texas, to be operated by Consolidated, the other at Tulsa, Okla., which the Douglas Aircraft Company will operate.

New $11,000,000 Plant

"The Ford Motor Company" Mr. Carlton said, "is about to build a new $11,000,000 plant in which it will build airframe assemblies for this bomber, and the Ford Company believes that it will be possible to have this plant in production before the end of this year. This plant will produce wings, fuselages, noses and stabilizer assemblies on a moving production line which it is believed will prove unique in the aviation industry.

"The immediate plan is for Ford to build 600 sets of assemblies for the Consolidated B-24D long-range, four-motor bomber, and the same number for the Douglas Aircraft Company. Production early next year is expected to reach 50 complete assemblies per month for each company. This huge new plant will be located near Ypsilanti, Michigan. The first section will be 800 feet wide and 300 feet deep; behind this will be another section 1,200 feet long and 400 feet wide, and if the government decides to assemble complete planes in this plant, the building will be extended to house an assembly line a mile and a quarter long."

The Ford Company is already undertaking other large defense orders, said Mr. Carlton. They now have nearly completed a $21,000,000 aircraft engine plant, for which ground was broken last Sept. 17. This will produce Pratt and Whitney engines at the rate of one per hour. These, he said, are 18-cylinder, double-row radial engines of two types, one developing 1850 and the other 2000 horsepower.

The General Motors Corporation has undertaken production of parts and assemblies for 100 B-25 bombers per month. The G-M Allison Division in Indianapolis, he stated, is turning out 350 liquid-cooled engines monthly, a number which will be increased several fold in the near future. The Buick division is breaking ground for a plant in Chicago to build 500 Pratt and Whitney radial engines per month. The corporation will also build submarine engines for the Navy, airplane control instruments, machine guns, and many other articles, their defense assignments already totalling $683,400,000.

Parts for Martin

The Chrysler Corporation will build parts for the Martin bombers, to be shipped to Omaha. They are also preparing to build tanks, and are building other military vehicles.

The Goodyear Tire and Rubber Company has been allocated the production of complete wing and all tail surfaces for the Martin B-26 bomber. They are also building wings and tail surfaces for the Consolidated PB-2Y3.

To the Hudson Motor Car Company, Mr. Carlton said, has been allocated the aft section of the fuselage for the Martin B-26, in addition to other work, some for the Wright Aeronautical Corporation, totalling several millions of dollars. At the end of the year, he told the meeting, the automotive industry will have 150,000 men working on defense production, in addition to the bomber program.

The technique of mass production of airplanes "is as far removed from automobile manufacture as the automobile was from carriage building," Henry C. Hill, of the Wright Aeronautical Corporation, declared.

Tenfold Increase

"We have been used to producing 200 or 300 engines per month, where now we need to produce 2000 to 3000 per month. In other words we must increase our rate of production approximately 10 times. To most people this increased production rate is merely a matter of applying the well-known production methods of the automobile industry. This naive statement has just enough truth in it to confuse the minds of many people both inside and outside of the aviation industry. Between the statement and the actual fact the gulf is very wide indeed. It is true that the principles developed by the automobile people in Detroit must be applied to aircraft and engine production, but we are sure that it is equally true that these principles must be modified and further developed to suit the new set of standards and the new tempo required in the aircraft field."

Mr. Hill pointed out that civil aviation does not require more than a small fraction of the number of planes used for military purposes.

"Diverting our design and construction efforts from commercial to military aircraft is relatively easy compared to the main problem confronting us—which is mass production," he stated. "There was no mass production in aircraft or aircraft engine manufacture before Germany tried it. It is a striking fact that airlines as we know them now do not need many airplanes to carry on a very substantial traffic. The reason for this is that the airplane completes its trip so quickly that many more trips are possible with the same airplane in a given period of time, than with the train, or the automobile. The trip from New York to Chicago, for example, takes 4¼ hours by air. It is obvious that in a 24-hour day three or four one-way trips can be made with only one airplane. It is significant that the largest domestic airline in this country has all told less than 100 airplanes."

GENERAL SCIENCE

Scientists for Defense

Half Million of Them Will Ultimately Be Listed in National Roster; Machines Facilitate Selection

By MARJORIE VAN DE WATER

NOW 150,000 scientists and specially trained experts are registered in the National Roster of Scientific and Specialized Personnel. A thousand cards are being added to this unique file each day.

These experts are not registered for any sort of "draft." But they have voluntarily supplied the government with information about their training, special talents, scientific apparatus and facilities for research so that the greatest possible use can be made of this important national asset of trained and gifted minds.

The Roster is a key part of the concerted effort of the government to find qualified men for America's defense effort.

An "all-out" attack is being made on the problem of discovering, picking and placing men with all sorts of abilities—explosives expert, typewriter repair man, instrument maker, airplane mechanic, cook.

The attack is being made on several fronts, but all of them are meshed together in a harmony of effort and standardized system that will help to prevent duplication of effort and waste of time or misuse of manpower.

Employment in private industries working on defense orders is being handled by the U. S. Employment Service. It is there that an industrialist goes when he has the problem of increasing his staff from 5,000 to 18,000 or from 15,000 to 45,000 to handle new defense orders.

Hiring for the government itself is done mostly by the U. S. Civil Service Commission, which has streamlined and mechanized methods to keep pace with the demands of defense urgency.

Within the Civil Service, a new Interdepartmental Placement Service is making government service more flexible, speeding workers into defense jobs for which they are specially qualified by transfer from other government jobs of a less urgent nature.

The Government Service is one of the largest industries in the United States, employing more than a million persons. And expansion may be expected to be rapid to care for the defense work in the months ahead. It is estimated by a Civil Service official that more than 400,000 civilian employees will be added to the government payroll each year.

Untrained men and youth and individuals whose skills have grown "rusty" through years of depression and unemployment are being given training courses. In this, five government agencies are cooperating.

But the most unusual attack on the problem of finding qualified men for jobs is that undertaken by the recently organized National Roster of Scientific and Specialized Personnel.

No one knows today how many scientists and experts in specialized fields Uncle Sam has to call upon. No one knows just where they are located, what unique knowledge they each possess, how urgent the work on which they are now engaged.

England, on her Central Register, which lists scientists and specialists, has 200,000 names.

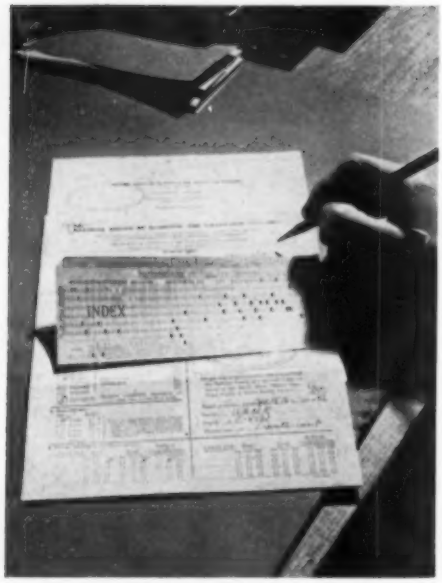
In about four months, America's Roster has built up this country's list to 150,000, and it is hoped that eventually a half million will be included in this index to the nation's best scientific brains and vital technical skill.

Officials of the Roster, under the direction of the psychologist-college president, Dr. Leonard Carmichael, of Tufts College, began by rushing the listing of physicists and psychologists because it was in these fields that the demand was greatest.

Questionnaires have now gone to experts in: aeronautical engineering; anatomy; anthropology; automotive engineering; bacteriology, immunology and pathology; botany; chemistry; chemical engineering; civil engineering; economics; electrical engineering; foreign languages; forestry; genetics; geography; geology; geophysics; heating, ventilating,

CROWDED

National Roster employees share the crowded quarters of the U. S. Civil Service Commission. Note the files which extend to the ceiling and the improvised coat racks. These workers are transferring the information provided by scientists on their questionnaires to the punch cards.



PUNCHED

The holes in the card tell the same story, in code, as does the questionnaire which has been filled out and returned by one of the half million scientists who will some day be included in the National Roster.

air conditioning, and refrigeration engineering; history and political science; mathematics; mechanical engineering; mining and metallurgical engineering; personnel administration; physics and astronomy; physiology; plant pathology; horticulture and agronomy; radio engineering; psychology; sociology; safety engineering; speech pathology; statistics; testing materials; tropical medicine, and zoology.

If you are an expert in any of these fields and have not received a questionnaire, you may obtain one by writing to the National Roster at Washington.

The response has been excellent. Among the physicists, the first scientific field canvassed, 75 to 80 per cent of the questionnaires were put on file after a single mailing and one post card reminder to those whose response was somewhat delayed.

Complete listing of all the questionnaires from these fields probably cannot be finished for several months.

This is not delaying the handling of requests for experts, however. Demands for men with special knowledge or unusual skill and experience are being sent frequently to the Roster, practically all from the government's defense agencies. Usually, the official making the request has before him the list of names he has asked for in a matter of hours. Every request received so far by the Roster has been filled, although in about 5% of the cases it was necessary to resort to correspondence or indirect means.

Modern machines that are almost uncanny in the speed and ingenuity with which they work make possible this swift filling of defense orders for more scientific brain power.

Einstein, Compton, and every other scientist whose name is included in this Roster, filled in a questionnaire in which he listed his fields of research or writing or other work, the languages he reads and speaks, the scientific instruments he owns or operates, and even his hobbies. All these things are indicated by means of holes punched according to a code in the card assigned to that individual.

Even the name itself is coded. This is done by an ingenious system called the "alpha numerical index." As each questionnaire is received from a scientist, it is assigned a number. And the method of number assignment is such that after all the questionnaires have been received and put in file in numerical order, they will also be in strict alphabetical order.

Numbers up to 9,999,999 are being used. These are apportioned among alphabetic divisions, so that each block of 10,000 numbers is devoted to a section which will contain 1,000 names out of the half million total expected.

The file clerk who wants to find the papers of John X. Doe, for example, needn't search laboriously through all the D's, or the Does, or even the John Does, she can go directly to number 1,882,005 and there she finds the file.

Each card on the Roster has a duplicate. One is filed alphabetically by number. The other is filed in a special section devoted to the science of the man registered.

When a request comes to the Roster for a psychologist who has traveled in South America, can speak Spanish and can fly an airplane, the punched cards can be run through a mechanical sorting machine which will select, within a matter of minutes, every individual on the list who meets those particular requirements.

Listed Automatically

The names of scientists selected and all the information about them, in code, are automatically listed on a tabulating machine and a messenger can be dispatched with the request filled!

These same kinds of punch cards and sorting machines—and as far as possible, the same code—are being used to speed the selection of workers in the U. S. Employment Service, the reassignment of employees in the Placement Service, and the classification of draftees in America's new army.

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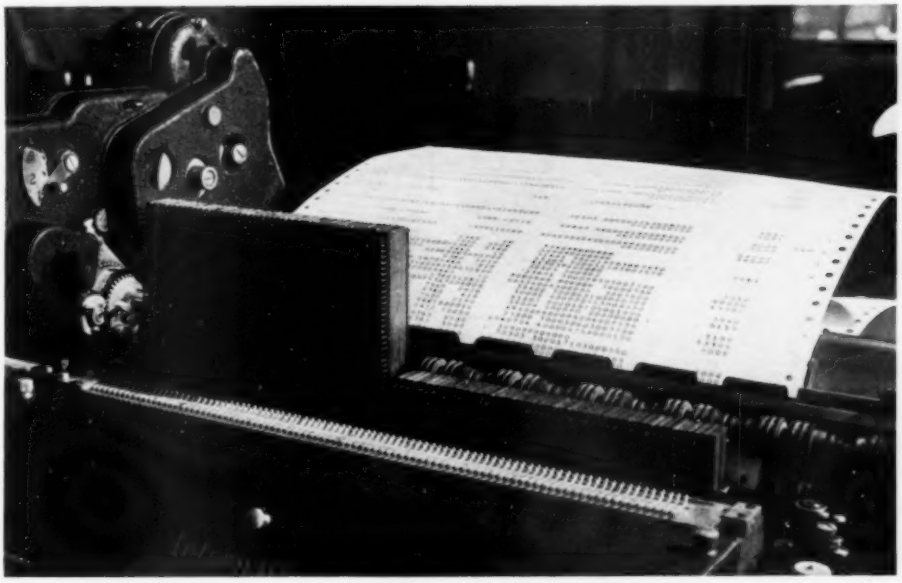
SORTING

James C. O'Brien, executive officer of the National Roster of Scientific and Specialized Personnel, is watching the operation of one of the machines which automatically sorts the thousands of cards in the Roster to select those scientists with certain desired qualifications.



INVENTORY OF BRAINS

This machine, with almost uncanny talents, lists automatically all the scientists who fill the specifications of defense officials, together with the information they have provided about themselves.

PUBLIC HEALTH

Fifth Columnist Mosquitoes Crushed By Malaria Fighters

No Sign of Dreaded Disease-Carrying Insect From Africa Found in Brazil at End of Year 1940

FIFTH columnist mosquitoes that slipped unnoticed into Brazil and for more than a decade have wreaked destruction on human lives have been driven from their last stronghold.

No sign of the dreaded malaria-carrying mosquito from Africa, Anopheles gambiae, was found in Brazil during the last 47 days of 1940, the Rockefeller Foundation announces.

"Those directing the campaign no longer consider it rash to speak of the eradication of gambiae from Brazil," the Foundation's president, Raymond B. Fosdick, stated in his review of the Foundation's activities during 1940. (*Reviewed, SNL, this issue.*)

"It must be remembered," he added, "that the struggle will not be won until the last fertilized female gambiae on this side of the Atlantic is destroyed."

The mosquito had been spreading at an alarming rate in northeastern Brazil and the malaria which it produced was of a very virulent character. It is believed that it came into Brazil on an airplane or one of the fast French destroyers which at the time of the discovery of the mosquito in Brazil in 1930 were serving the French air line between Dakar in West Africa and Natal in Brazil.

This hemisphere defense job of routing the African mosquito invaders was carried out, with the collaboration of the Brazilian Government, under the direction of Dr. Fred L. Soper, of the Rockefeller Foundation. Enlisted under him in the battle was a staff of over 2,000 doctors, technicians, scouts, inspectors, guards and laborers.

Health defense in the Western Hemisphere and in Africa also has been aided by the yellow fever vaccine developed in the Rockefeller Foundation's International Health Division laboratories. Enough vaccine for 1,000,000 or more doses is being supplied to the United States Army for vaccination of military personnel and to the U. S. Public Health Service. At the request of the British Government, 250,000 doses were sent to the Sudan, where a sharp epidemic involving thousands of cases and many deaths occurred in 1940. Another 250,000 doses will be sent in the near future.

The outbreak was in no way related to the movement of troops and was largely confined to the native population, Mr. Fosdick said he had recently been informed.

The risk to human beings entering South American jungle regions where yellow fever may lurk can now be determined without waiting until human deaths show the presence of the disease in a particular jungle region. Tests of wild animals can be made in advance and if the tests show that the wild animals of the region have the yellow fever virus in their veins, men entering the region can protect themselves by vaccination. Yellow fever is primarily a disease of jungle animals, transmitted from animal to animal, as from man to man, by mosquitoes.

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Three Flu Vaccines

VACCINES to protect against three different types of influenza will be ready for experimental testing by the winter of 1941-1942, is the hope of Rockefeller Foundation authorities and influenza researchers.

During 1940 a vaccine against one type of influenza was developed and tried in Puerto Rico, Cuba, California, Florida and Alabama. In the first two places the vaccinations were done too late to give any evidence of the protective value of the vaccine. In California "there was a suggestion" that there was less influenza among the vaccinated than among the unvaccinated groups.

In Florida and Alabama the vaccinations had been given four months before the influenza outbreak occurred. It will be months, however, before completion of the laboratory studies necessary to determine accurately the percentage of persons who suffered from influenza A in this epidemic. Final conclusions about the effect of the vaccine cannot be made as yet.

"However," the report states, "the results which are available to date suggest that, although this vaccine is by no means perfect, it may have some practical value as a prophylactic measure against one type of influenza."

A surprising discovery was made during the 1940 investigations. The cases during a single epidemic were not all caused by one (*Turn to page* 207)

MEDICINE

War Stops Research Giving Lead on Cancer

GERMAN bombs have stopped a promising lead in cancer investigations and thus delayed possible development of means of saving cancer-threatened lives in Germany as well as elsewhere.

This effect of the war appears in a report from Dr. I. Hieger, of The Royal Cancer Hospital (Free), London, England, to *Science*. (March 14). Dr. Hieger, stopped by war conditions from breeding the mice needed for his experiments, has turned to this American publication to report his results to date, probably with the hope that other cancer researchers in peaceful countries will continue the work.

He has been trying to extract cancer-causing substances from "precancerous" tissues of mice. Other scientists have reported extracting such material from human breast cancer and from the liver of a patient dead of cancer of the stomach. Among the small number of mice with which Dr. Hieger was starting the work, one developed cancer at the place where he had injected fatty material extracted from precancerous breast tissue of other mice.

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AERONAUTICS

New Riveting Method For Use on Airplanes

A NEW method of riveting, especially valuable for airplanes in putting together the metal sheets that form its outer shell, is one of the 770 inventions protected recently with patents from the U. S. Patent Office. This method gives a perfectly smooth outer surface, without the projecting domed rivet heads used in earlier methods. It possesses great strength and makes an airtight seal, important where the cabin pressure of a plane at high altitude is kept at its sea level value.

Invented by Vladimir H. Pavlecka, of Santa Monica, California, and granted patent 2,233,820, rights on the idea are assigned to the Douglas Aircraft Co. Though especially designed for aircraft construction, Mr. Pavlecka states that his invention will be of use in other industries as well.

At the high speeds reached by modern planes, even the slight projections made by old style rivets cause a noticeable drag and loss of speed. In this invention, the rivet is hammered into a hole in the sheets to be joined. In back of the rivet is a cup, with a hole into which the shank of the rivet passes. The conical head of the rivet bends down the metal around the hole in the sheets until it is flush with their surface. Then, while the hammer is still in place, a piston-like rod in the hole of the rear support is driven up, and this mashes down the shank of the rivet over the inside of the metal sheets. Thus, on the inside of the plane, there are small bumps, but these do not affect the speed.

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ZOOLOGY

Two Albatrosses Brought Back From Galapagos

TWO MALE albatrosses, believed to be the only living specimens of their kind in captivity, are the special prizes of the Mandel Expedition of the Field Museum of Natural History, just returned from a three-months' expedition to the Galapagos islands. They will be turned over to Chicago's Brookfield Zoo, along with other birds and reptiles collected by the expedition.

The expedition has also brought back about 2,000 skins and preserved specimens representing the bird, reptile and fish faunas of the 15 islands visited during the cruise. These will be deposited at the Field Museum.

The bird collection, comprising 425 skins, will be used in preparing a museum exhibit illustrating the theory of evolution. It was during a scientific voyage that took him to the Galapagos islands a little more than a century ago that Charles Darwin conceived the famous theory connected with his name.

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INVENTION

Nickel Gadget Lifts Paraffin From Jelly

A PURE nickel handle and tab will be useful to housewives putting up jellies. It is laid on the top of the jelly, paraffin is poured around it. A tab projecting upward passes through a slit in the cap, also of nickel, and is bent down to hold it in place as a lock. When opened, the tab is a handle for lifting the paraffin. Unaffected by the preserves or the bending, it may be used over and over again. (*H & H Co., Mountain Lakes, N. J.*)

Science News Letter, March 29, 1941

IN SCIEN

GEOLOGY

U. S. Scientists Studying American Ore Deposits

SCIENTISTS of the U. S. Bureau of Mines are carefully examining American deposits of tungsten, manganese, nickel, mercury and other strategic metals with an eye to their use if present overseas sources should be suddenly cut off. Exploratory operations on 32 sites have been conducted, of which seven have been completed. Six new ones will be opened up as soon as weather permits, Dr. R. R. Sayers, director of the Bureau, stated.

Existence of these ore bodies has long been known, but many of them are too low-grade to be economic under normal conditions. A serious emergency might justify the higher cost of working them.

Tin remains the outstanding metal problem, for there is practically none of it in all North America. If we should lose access to overseas sources it would be necessary to rely on accumulated stockpiles and find substitutes.

Science News Letter, March 29, 1941

AGRICULTURE

Cotton Grown in Italy As During U. S. Civil War

COTTON is being grown in blockaded Italy, states *Die Umschau,* (January 19). Last year's crop was raised on a little under 125,000 acres, and it is planned gradually to increase the acreage to double that figure. Even so, this home-grown cotton can satisfy only about 6% of Italy's normal needs; yet greater acreage could be devoted to the crop only at the expense of the area now planted in wheat.

Italy's present cotton-raising venture repeats the country's experience during the American Civil War, when the supply of American cotton was cut off by the Federal blockade of Southern ports. In 1864, which was peak production year, Italy had well over 200,000 acres in cotton. In subsequent years, interest in cotton production declined, to a low of only a little more than 8,000 acres in 1930.

Science News Letter, March 29, 1941

NE FIELDS

METEOROLOGY

Uncle Sam is Hunting New Weather Men

UNCLE SAM wants recruits for something besides the Army: he is on the keen lookout for new weather men. The U. S. Civil Service Commission announces new examinations for meteorologists, to fill positions paying from $2,600 to $5,600 a year.

Requirements for the new jobs are: first, at least four years of college work with majors in meteorology, physics, geology or other related subjects; second, responsible professional experience in meteorology. Teaching or graduate work will be counted in fulfilment of this requirement, under certain conditions.

Lists will be open until the end of the present year, but candidates are urged to apply at once. Information can be obtained at the larger postoffices, or directly from the Civil Service Commission, Washington, D. C.

Science News Letter, March 29, 1941

RESOURCES—MEDICINE

California Replaces Japan As Source of Needed Agar

AGAR, a laboratory and hospital necessity, hitherto obtained almost altogether from Japan, will still be available in adequate quantities from an American source if commerce with Japan is interrupted. The United States Agar Company, San Diego, has just completed a new plant which will triple its former output of a maximum of 20,000 pounds a year.

Agar is a gelatin-like substance of vegetable origin, extracted from two closely related species of seaweed. Used for food in Japan, it was found to be an ideal medium for the cultivation of bacteria, molds and other microorganisms. It has also come into considerable use in medicine, where filling bulk is wanted without roughness. Large quantities of agar have been imported, in the dried condition, from Japan every year.

Some years ago a group of Japanese in San Pedro, finding suitable quantities of the right kind of seaweed along the southern California and Lower California coast, undertook to manufacture agar in this country. They were bought out by an American company, which subsequently failed. A new firm, the present United States Agar Company, was formed; San Diego proved to be a more favorable location.

While Japanese agar was selling for 50 cents a pound a few years ago, its price has now gone up to $1.50 and is still rising. The American firm has held its price steady at $1.40, claiming superiority in quality to offset the price differential. Now it also enjoys the advantage of a lower price.

Production figures tell the story of the growth of the San Diego firm. In 1936 the output was 4,000 pounds. It rose to 5,000 pounds the following year, and to 7,000 pounds in 1938. Then, in 1939, the figure almost doubled, to 13,000 pounds, and last year the 20,000-pound mark was passed. With an apparently unlimited supply of raw material in sight on the nearby sea bottom, the company is confident of being able to carry its share of the scientific and medicinal defense load.

Science News Letter, March 29, 1941

MEDICINE

Quicker Discovery of Cancer Spread to Spine

A BETTER, quicker way to discover the spread of cancer to the spine appears in a report by Dr. Samuel A. Wolfson, Dr. Samuel Reznick and Dr. Lewis Gunther, of Los Angeles. (*Journal, American Medical Association,* March 15.)

Long before X-ray pictures suggest the spread of the cancer to the spine and even when a primary cancer is not suspected, three signs will give an accurate diagnosis. These signs are: (1) nerve root pain similar to that of arthritis of the spine but with certain distinct differences; (2) an increase in the speed with which red blood cells settle to the bottom of a tube, shown by a test known as the sedimentation test; and (3) an increase in the phosphatase in the blood plasma.

Early diagnosis of the condition is imperative, the Los Angeles doctors point out, because X-ray treatment is the only hope for successful treatment and often produces dramatic relief of pain and remarkable regression of the new growths that have spread from the original cancer.

Science News Letter, March 29, 1941

ENGINEERING—PHOTOGRAPHY

Speed X-Rays Permit Views of Moving Machines

See Front Cover

NO; the skeleton in the closet has not come out to shave. The cover picture on this week's SCIENCE NEWS LETTER represents one of the newest industrial applications of X-rays. By charging condensers to about 90,000 volts, then discharging them through a special type of X-ray tube, Westinghouse engineers are able to take pictures with them at exposures approximating a few millionths of a second.

The gentleman whose picture appears is of flesh and blood, and he is using a standard electric razor. The picture reveals just what happens inside the mechanism when it is in use.

Science News Letter, March 29, 1941

ENTOMOLOGY

Grasshoppers Not Expected To Be Serious This Year

GRASSHOPPERS will not be as serious a pest during the coming summer as they have been for the past three seasons, field surveys by U. S. Department of Agriculture entomologists indicate. They will be both fewer in numbers and less widespread in area under severe attack.

The only large areas shown in black on the grasshopper map comprise the Dakotas and western Minnesota, and western Kansas and parts of adjoining states. There are also smaller threatened spots widely scattered over the West.

However, even with the reduction in the menace, something over the weight of a new battleship (45,000 tons) in arsenic-poisoned bran-sawdust bait will still be required to hold back the hopping hordes in the threatened areas. Grasshoppers are like weeds, the scientists point out: if you let them go unchecked one year they come back at you the next with hundredfold reenforcements.

Science News Letter, March 29, 1941

ENGINEERING

Fan to Cool Radiator Has Thermostatic Control

A FAN used to cool the radiator of a gasoline or diesel engine has a thermostatic control. When the radiator is cool enough, the blades flatten, and move no air. (*Kontrol-Fan, Inc., Pasadena.*)

Science News Letter, March 29, 1941

ASTRONOMY

Longest Constellation

April Evenings Provide Best Opportunity to See Hydra, Which Extends More Than Quarter Way 'Round Sky

By JAMES STOKLEY

THOUGH a number of bright stars are seen in the sky this month, and, in the early evening, two planets as well, you now have the best chance to see a constellation that, while not of great brilliance, holds a record. It is the longest in the sky.

This is Hydra, the water-snake, which extends through 105 degrees of the sky, more than a quarter of the complete way around the globe of the heavens. On our maps, it is shown in the south, as it appears around ten o'clock at the beginning of April, an hour later at the middle, or two hours later at the end of the month.

A good way to find this group is first to look for Leo, the lion. The "sickle," with bright Regulus at the handle's end, is easily located, high in the south. Low in the southwest is Sirius, brightest of all the stars, in Canis Major, the great dog. Above is Procyon, in Canis Minor, the lesser dog. And just about half way between Procyon and Regulus is the quadrilateral which represents the head of Hydra. The brightest of these four stars, the one nearest Regulus, is called Alphard. It is of the second magnitude.

Crow Pecking at Snake

First magnitude Spica, in Virgo, the virgin, to the southeast, is just above the water-snake's tail. Also near the end of the tail is Corvus, the crow, a group of four stars whose shape resembles a ship's sail. On the old star maps, the crow was represented as pecking at the snake.

Looking to the north, it is possible to see another snake-like creature among the stars—the dragon, Draco. His head, another quadrilateral, is above the bright star Vega, low in the northeast, his tail winds around the little dipper, ending just under the pointers, in the big dipper. Brightest star in Draco is Thuban. Thousands of years ago, at the time the pyramids were built in Egypt, this was the pole star, but the pole has moved away, because of the slow movement called the "precession of the equinoxes."

In addition to the first magnitude stars already mentioned, the maps show several others. These are Arcturus, high in the east, marking Boötes; Betelgeuse, in Orion, in the west; Aldebaran, in Taurus, low in the west to the right of Orion and Capella, in Auriga, to the northwest, above and right of Taurus.

The brilliant planet Jupiter, and also Saturn, somewhat fainter, appear in the west, early in the evening, with the former above. They have separated considerably since their close conjunction in February. Another planet, Mars, rises late at night, about three hours before the sun, in Capricornus.

Eclipse of Aldebaran

During March there was a partial eclipse of the moon, and in April there is an "eclipse" of another kind. On the evening of April 1 (and this is no April Fool joke!) the moon will pass in front of, and eclipse, the brilliant red star Aldebaran, in Taurus, the bull. While this is caused in exactly the same way as an eclipse of the sun, another name is given to it. When the moon goes in front of a star or planet, astronomers call it an "occultation." The disappearance of the star is called the "immersion" and its reappearance the "emersion."

Best place to see the occultation will be in the Mid-West, but something of interest will be visible in all parts of the United States and Canada. In Illinois, for example, immersion comes at 9:16 p.m., central standard time, and emersion at 10:08 p.m. In Washington, immersion comes at 10:17 p.m., eastern standard time, but emersion happens after the moon has set.

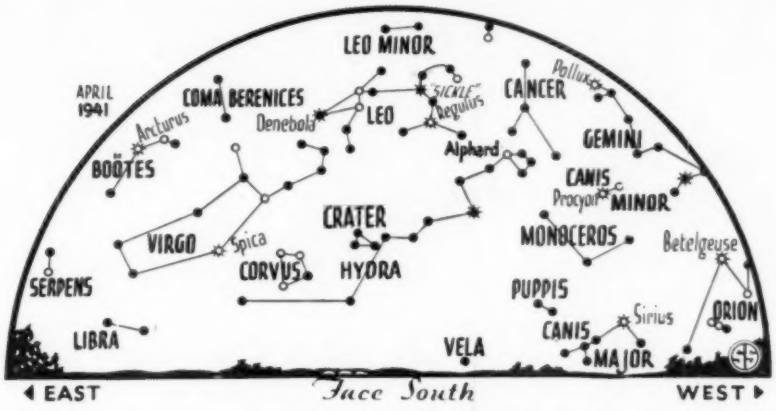
Along the Pacific Coast, the occultation will be over before sunset, but after dark the star and moon will still be close. However, people in that region need not be disappointed, for they will have another chance to see Aldebaran occulted in the early morning hours of August 16.

Telescope Unnecessary

Living in the right parts of the country, you will be able to see this occultation on April 1 with the naked eye, but better will be some small optical aid, like a pair of binoculars, or even opera glasses. The moon will be five days past new, in a crescent phase. Moving eastward as it does, the dark half of the moon will be ahead, and this means that the star will hide in back of its dark limb.

Because the moon has no layer of atmosphere, to cause a gradual reduction of light, the star will appear with full brightness until it reaches the lunar edge, then will vanish instantly. Emersion, of course, will occur from behind the moon's bright, or sunlit, edge. At many observatories astronomers will watch the occultation, and make accurate determinations of the times, for from these it is possible to check accurately the motion of the moon.

The full moon on the afternoon of April 11 is of particular interest because it is the "paschal full moon," the one which determines both the date of Easter and Passover. It also happens that less than a day later the moon is at perigee, or nearest earth, at a distance of 222,000



miles, or about 17,000 miles nearer than its mean distance.

This will have a bearing on the height of the tides. These, as most people know, are caused by the gravitational pull of both moon and sun. When these bodies are in line, as they are at new or full moon, the two pulls reenforce each other, and the tides are extra high or low. These are the spring tides, which have nothing to do with the season, since they occur in autumn as well. Neap tides occur at first and last quarter, when the effect of the moon counteracts that of the sun, and the extremes are much less.

The distance of the moon from the earth also plays a part, for its effect is most when closest. So when it is closest at the time of full moon, as it is this month, the tides reach a maximum. At Sandy Hook, for instance, on April 3, the neap high tide reaches a height of only 3.5 feet above mean low water, a rise of only 3 feet from the preceding low. But on April 12 the high spring tide, at a height of 6 feet, is 7.4 feet above the previous low.

At Dover, England, where the tidal changes are greater, the spring high on the 12th at 11:38 p.m. London time, is 20 feet above mean low water, 5 feet higher than the neap high on the 4th. If the Nazi invasion has not previously been attempted, Hitler might find that a good opportunity, since the full moon would furnish illumination.

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Celestial Time Table for April

Tuesday, April 1, after 9:00 p.m., Occultation of Aldebaran. **Friday, April 4,** 7:12 p.m., Moon in first quarter. **Thursday, April 10,** 4:26 a.m., Algol at minimum. **Friday, April 11,** 4:15 p.m., Full moon. **Saturday, April 12,** 3:00 a.m., Moon nearest; distance 222,000 miles. **Sunday, April 13,** 1:15 a.m., Algol at minimum. **Tuesday, April 15,** 10:04 p.m., Algol at minimum. **Friday, April 18,** 8:03 a.m., Moon in last quarter; 6:53 p.m., Algol at minimum. **Saturday, April 19,** 12:26 p.m., Moon passes Mars. **Monday, April 21,** early a.m., Meteors of Lyrid shower visible. **Saturday April 26,** 8:00 a.m., Moon farthest, distance 252,600 miles; 8:23 a.m., New moon. **Sunday, April 27,** 4:59 a.m., Moon passes Saturn; 5:55 p.m., Moon passes Jupiter.

PUBLIC HEALTH

Measles Increasing Among Civilians But Not In Army

MEASLES is continuing to increase among the civilian population but fortunately the young men in Army training camps have escaped the epidemic.

A total of 43,060 cases were reported by state health officers to the U. S. Public Health Service for the week ending March 15. The previous week's total was 34,420. States chiefly affected are New York, Pennsylvania, Ohio, Illinois and Michigan, each of which reported 4,000 or more cases for the week. Virginia reported 1,900, New Jersey 2,500 and North Carolina 921.

There is no recognized epidemic of measles or any other respiratory disease in any of the Army training camps at the present time, according to reports received in the Surgeon General's office.

Army medical authorities feel they have been fortunate because no epidemics of respiratory disease have occurred in the training camps this past winter. Even influenza, which was widespread throughout the civilian population, did not reach epidemic proportions in the training camps.

One reason for the absence of these diseases, it was pointed out, is the system whereby the young men are held in many small reception centers for a considerable period before being sent to larger training camps. The period of stay in the reception centers is long enough to cover the incubation period of the ordinary communicable diseases.

"Working quarantine" is another measure used by the Army to fight epidemics. If one or two men in a company get measles, the entire company would be put in work-quarantine, going ahead with their work, but segregated from the rest of the men in the camp. This helps to limit the spread of the disease.

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ICHTHYOLOGY

Electric Device Aids In Study of Herring

"ELECTRIC detectives" are the newest aids to Canadian scientists engaged in the study of the lives and travels of Pacific Coast herring. Data obtained are needed for the more intelligent and efficient management of this important natural food resource.

The scientists insert metal tags bearing date and place of capture into the bodies of herring hauled up in their nets. Then they toss the fish overboard again. After a time, some of the tagged herring are again captured by commercial fishermen, along with thousands of other, untagged fish.

At the processing plant, induction coils on the conveyor system pick out the tagged fish by the electrical disturbance set up by the metal tags as they pass the coils. This causes a trap door to open, and the tagged fish fall through, along with some others.

Later, all the fish caught through the trap door are sent over the conveyor system again, spaced some distance apart, and this time only the tagged fish fall through the trap door. From these tagged fish, scientists can then reconstruct the story of each herring's travels and growth since its first capture. Gradually, by this and other means, the scientists can build up an accumulation of data on the life and ways of herring and thus ascertain what steps are desirable to conserve the fishery and protect fishermen's interests.

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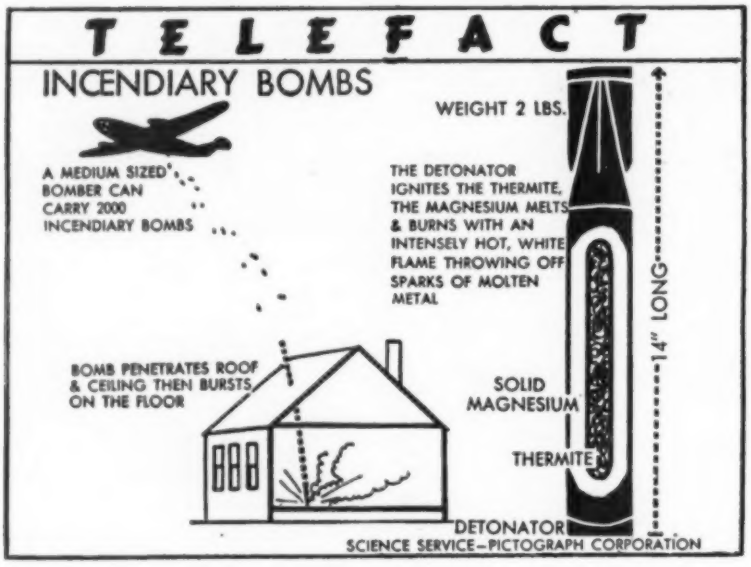

AERONAUTICS

Amusement Park Airplane Ride May Launch Big Aircraft

Suggestion Made By British Inventor That Device Be Used as Gigantic Sling Shot To Catapult Planes

SOMEWHAT modified, the familiar amusement park device, in which the customers are whirled around in airplane-like cars attached to cables, may prove of use in launching heavily loaded bombing planes. The idea is that an arrangement such as this be used as a gigantic sling-shot, the plane swung around and around until it gains sufficient speed, then released to go on its way.

This suggestion by an English inventor, P. B. Shead, is described in a recent issue of a British aviation weekly (*Flight*, Jan. 23).

It is one of various arrangements that have been proposed to give a plane extra lift at the takeoff. Much more power is required to get it off the ground than to maintain it in flight. That means that a plane able to take to the air with a heavy load has power to spare when under way.

To overcome this, double airplanes have been employed. That is, a light plane, with a relatively heavy load, rides piggy-back on a bigger, more powerful plane. When in the air, the light plane breaks away, to continue on its flight, while the big one returns to its base. Catapults, familiar for launching planes from ships, have also been used on land, to give the plane the extra push at the start.

As proposed by Mr. Shead, a long captive wing is pivoted to a tower. In this wing is a powerful gasoline engine, with propellor, to drive it around.

When not in use, the end of this captive wing touches the ground. The plane to be launched is fastened to it, and its engines, with those on the wing, start swinging it around. When enough speed is attained, the plane lets go, the centrifugal force giving it a good start.

The writer in *Flight* comments on the idea as follows:

"At first sight the idea seems, quite frankly, to be fantastic. 'What,' one immediately asks, 'will happen to the aircraft when flung off the merry-go-round tangentially?' The inventor argues that as the long captive wing is revolving comparatively slowly, centrifugal force will not be excessive, and anyway, the aircraft is banked to approximately the correct angle for the speed and radius of turn. The intention is that a large wind indicator should be mounted on the top of the tower so that the pilot can pull his release just before the aircraft is turning into the wind.

"It may be, of course, that an outward skid is desirable at the instant of release. One would imagine that, since the aeroplane is mounted at the tip of the captive wing, the latter would tend to rise sharply when relieved of the weight of the aircraft, so that there might well be risk of collision. As Mr. Shead has made provision for tail surfaces for the captive wing, and has mounted it on the tower by a universal joint, arrangements could presumably be made for decreasing the angle of incidence of the captive wing at the moment when the separation occurred.

"As for the mechanical details, the intention is that the engines of the captive wing should be aero engines (in the working model they are represented by an electric motor). They could be mounted in tandem and this is actually represented in the model. Pipe lines would lead from the tower to the engines, and there is an automatic device which throttles down the engines at the instant of separation. The captive wing then glides to the ground along its spiral path, and when the wheels touch, the engines are automatically switched off.

"Mr. Shead points out that as the cradle on the captive wing is close to the ground, a ramp can be provided which will make it possible to get the next aircraft loaded-on very quickly, so that the possible frequency of launch should be fairly high. This would be important if bombers were being launched. Another advantage claimed is that different types could be launched."

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Effective natural *camouflage* is bestowed on the tiger, whose striped coat blends with jungle grasses in sun and shadow.

● Earth Trembles

Information collected by Science Service from seismological observatories resulted in the location by the *U. S. Coast and Geodetic Survey* of the following preliminary epicenter:

Saturday, March 15, 0:46.3 a.m., EST

In lower California. Latitude, near 28.1 degrees north. Longitude, 113.6 degrees west. Sharp shock.

For stations cooperating with Science Service, the Coast and Geodetic Survey, and the Jesuit Seismological Association in reporting earthquakes recorded on their seismographs, see *SNL*, Feb. 22, 1941.

PSYCHIATRY

Health Service Advised To Attack Mental Disease

DISEASES of the mind and nerves, which afflict more than half a million persons in the United States and consign at least that number to hospitals or other institutions, will be attacked on a nation-wide scale by the U. S. Public Health Service if plans drawn at the first meeting of the National Advisory Council on Nervous and Mental Diseases are carried out.

Establishment in or near Washington of a National Institute for Research on Nervous and Mental Diseases, similar to the National Cancer Institute and the National Institute of Health, was recommended. The proposed Institute would cooperate closely with the National Institute of Health and St. Elizabeths Hospital, federal institution for the care of the mentally ill. Besides the clinical and laboratory research to be undertaken at the Institute, grants-in-aid for other research projects looking to the cure or prevention of mental disease may be made to responsible institutions throughout the country, it was proposed.

Members of the Advisory Council on Nervous and Mental Diseases, appointed by Surgeon General Thomas Parran, are: Dr. Edward A. Strecker, Professor of Psychiatry, School of Medicine, University of Pennsylvania; Dr. Nolan D. C. Lewis, Director of the New York State Psychiatric Institute and Hospital in New York City; Dr. Lloyd H. Ziegler, Associate Medical Director, Milwaukee Sanitarium, Wauwatosa, Wis.; Dr. Abraham Myerson, Clinical Professor of Psychiatry, Harvard Medical School; Dr. Arthur H. Ruggles, Secretary of the American Psychiatric Association and Superintendent of Butler Hospital, Providence, R. I.; Dr. Henry W. Woltman, Consultant on Neurology, Mayo Clinic, Rochester, Minn., and Dr. Findlay Gale, Jr., Professor of Neuropsychiatry, Medical College of Virginia, Richmond, Va.

Science News Letter, March 29, 1941

MILITARY SCIENCE

Fortifications of Concrete Not Useless Despite "Failure"

Army Engineer Approves Such Defensive Works When They Are Used in Conjunction With Troops in Open

CONCRETE pillboxes, steel turrets and other field fortifications are far from being outmoded and useless, despite the alleged failure of the Maginot line, declares Capt. William Whipple, Jr., of the Army engineer corps. (*Military Engineer, March-April.*) They are not self-defending, but when such defensive works are skillfully employed in conjunction with troops in the open they still have great military value, he asserts.

Since the present war began, fortified lines have been successfully breached in three engagements, Capt. Whipple states. These were the Russian breakthrough of Finland's Mannerheim Line, the German capture of Fort Eben-Emael in Belgium, and the penetration of the Maginot Line in the later stages of the Battle of France.

However, the record shows that the Russians were able to break the Mannerheim Line primarily because of their overwhelming numbers and the possession of heavy artillery and large numbers of bombers, and that even with these advantages they paid a terrific price in lives for their gains. Fort Eben-Emael was not defended with nearly the same degree of skill with which it was attacked, primarily by a crack company of engineers, and the Maginot Line was not even attempted by the Nazis until the mobile troops intended for its defense had been sucked into the struggle to the west after the break-through at Sedan.

Recently the Army has made studies of various techniques for attacking field fortifications, erected for "laboratory" purposes at Fort Belvoir in Virginia. Among other things, it was discovered that the very high-velocity, flat-trajectory shells of anti-tank and anti-aircraft guns were more effective than the much heavier projectiles of 155-millimeter field guns.

Well-directed small-arms fire, from rifles, automatic rifles and light machine guns, was found effective in driving defenders away from the gun ports. Hand-placed charges of high explosives and incendiary compounds, set by engineers who swarmed up to the fortifications under cover of darkness or smoke screens, proved able to disable the defenders' machine guns.

The only answer to such determined attack is not to depend altogether on the fortifications themselves, but to have mobile troops in reserve in the open, ready to meet attack with equally determined counter-attack.

Science News Letter, March 29, 1941

ARCHAEOLOGY

Hamath Wrecked to Terrify Small Opponents of Assyria

UNEARTHING the ruins of Hamath in Syria, Danish archaeologists have revealed the violence, fire and destruction wrought upon this Bible city that dared to stand up to steam-roller Assyria, conquering the world 2,600 years ago.

"The fate of Hamath was of course meant to terrify other states from pursuing a similar anti-Assyrian policy," Dr. Harald Ingholt, director of the excavations, declares. (*Asia*, April.) Dr. Ingholt, now lecturing on Syrian archaeology in this country, probed into ruins of Hamath for the Carlsberg Foundation of Copenhagen, every year from 1931 to 1938.

Why the Bible writers Isaiah and Amos mentioned Hamath as a dark warning to independent but weak small states is clear today from the condition of the long-buried wreckage, Dr. Ingholt points out.

"Gates, doors, furniture, the woodwork of the houses were thrown together to be burned," he writes, "and the basalt sculptures were broken to pieces or mutilated, the surface of all stone objects and wall slabs suffering badly from the heat of the violent fire."

So fiercely were some mud-brick buildings burned that they were left hard as stone, requiring pick-ax blades to remove fallen sections.

Several hundred arrows found by the archaeologists in one building are relics of the battle, says Dr. Ingholt, in which Hamath lost her independence in 720 B.C.

Revealing elegance of the old city, are inlay pieces for decorating furniture, such as ivory plaques representing flowers, fighting sphinxes, and bulls, still carrying traces of decoration with gold leaf. It was against such luxuries in Syria and Palestine that Bible prophet Amos preached, denouncing those "that lie upon beds of ivory."

The excavations have brought to light the citadel and official buildings, and such devices as stone lions that guarded entrances—not for decoration, explains Dr. Ingholt, but because the people thought the lions had real magic power to stop or destroy an enemy.

While these ruins represent Hamath at the peak of its power, they are only one of 12 levels of civilization which the Danes have explored on the site. Probing deep into the mound filled with successive ruins, the archaeologists traced the ancient career of Hamath beyond 4000 B.C.

Following its terrible fate at the hands of Assyrian King Sargon, Hamath was rebuit in a smaller way in the Hellenistic era, but mostly below the prominence of the mound. The historic mound today is on the edge of modern Hama, Syrian town of 40,000 people.

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PHYSICS

New Invention Will Detect Airplanes by Invisible Rays

Radio Corporation Given Rights To Device for Making Visible Image From Heat of Plane's Exhaust

LATEST addition to the long list of recent inventions for detecting airplanes by invisible waves is one which, the inventor claims, will even operate through fog.

Irving Wolff, of Merchantville, N. J., invented the new device, which was granted patent 2,234,328. He assigned his rights to the Radio Corporation of America, which holds the rights on most of the similar inventions patented in recent months.

Infra-red rays are emitted from the engine of a plane, as well as from its cloud of exhaust gases, or from the smokestacks of a ship. These are waves like those of light, but too long to affect the human eye.

"Instruments are now available, using photoelectric principles, for observing an invisible body radiating waves of a length slightly longer than light waves," declares Mr. Wolff in his patent specifications. "Such instruments will not operate where fog is interposed between the radiating body and the instrument, because the photoelectric means is not responsive to wave lengths which will penetrate fog."

With his new invention, he states, it is possible to detect "the existence of an invisible body radiating heat," and also "to produce a visible image of the original heat-radiating body." It may be used, he continues, "to detect the presence of an aircraft which is invisible to the eye because of fog." He suggests that it could be used for guiding aircraft to a landing in fog "by visible indications from desired points which are produced by devices radiating heat." In such an application, the airplane would be equipped with the device, permitting the pilot to see the special infra-red beacons on the field which would outline the runways.

In operation of Mr. Wolff's invention, the heat rays fall on a diaphragm, which is one plate of an electrical condenser. The heat rays distort the diaphragm, and the capacity of the condenser is changed. In the condenser microphone, formerly widely used in broadcasting, a similar idea was used, only the sound vibrations in the air distorted the diaphragm.

A bank of such condenser units, at one end of a vacuum tube, is used. These are sprayed by a stream of electrons. An infra-red transmitting lens, not of glass, or a concave mirror, focusses the heat ray image on them. Adjustment is made so that, when the electron beam falls on the other end of a unit where infra-red rays are falling, still more electrons are given off.

In one form of his invention, these are directed to a fluorescent screen at the other end of the tube. Here the electrons are turned into light, and there appears a light picture of a heat ray image formed on the receiving end.

The individual condenser units correspond to the dots in a half-tone newspaper picture. The more there are, the greater is the detail with which the view is reproduced.

In another arrangement, the picture appears on a separate tube, just as with a television receiver. This viewing tube may be some distance away.

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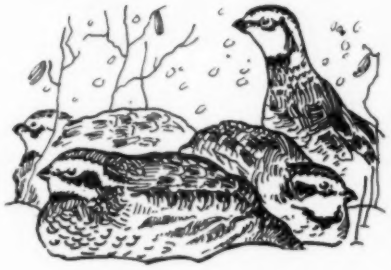
● RADIO

Dr. Peter Debye, of Cornell University, will discuss "Probing Matter with Electrons" as guest scientist with Watson Davis, director of Science Service, on "Adventures in Science," over the coast to coast network of the Columbia Broadcasting System, Thursday, April 3, 3:45 p.m. EST, 2:45 CST, 1:45 MST, 12:45 PST. Listen in on your local station. Listen in each Thursday.

WILDLIFE

NATURE RAMBLINGS

by Frank Thone



Quail Complications

SOME of the complications attending the management of bobwhite quail in the Southeast were described before the recent Sixth North American Wildlife Conference, held in Memphis, by two expert quail-rearers, H. L. Stoddard and E. V. Komarek, of Thomasville, Ga.

Stocking a public refuge or a private estate with quail isn't simply a matter of hatching enough quail eggs in an incubator, rearing the chicks in pens, and turning them loose when they are big enough to look out for themselves, they made plain. Quail—any game birds, in fact—have a host of troubles to face, a swarm of enemies to escape. And some of them lurk in places where you'd never expect to find them.

Probably the average citizen would think of hawks as Number One enemies of quail. Yet the Georgian experts don't bother much about hawks, except perhaps for such specimens of the Cooper and sharp-shinned species as make themselves too troublesome. Other hawk species take relatively few quail, and are too valuable as destroyers of rats, snakes and other nest-robbers to merit persecution. In any case, adequate cover on the refuge will take care of the hawk question fairly well.

We do not commonly think of one game bird species as being the enemy of other game birds. Yet in the experience of Mr. Stoddard and Mr. Komarek, wild turkeys are often rather troublesome quail-egg eaters, where the two species share the same range. If you have wild turkey and want quail, too, you'll have to shoot off part of the turkeys to give the quail a chance. Opossums, prized by some hunters, also devour many quail eggs and young.

Finally, there is that universal enemy of all birds small enough for it to kill, the house cat, especially the feral cat, or ownerless animal running wild in the woods. Cat depredations are particularly bad in the neighborhood of farms and villages, which are always foci of cat population. It is not easy to shoot them, for cats do the greater part of their hunting in the dusky hours. However, it is possible to trap them—and cats on a bird refuge deserve no better fate, no matter whose pets they may be.

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type of influenza virus. The existence of more than one type had been known for some time, but previously it had been believed that one type would be responsible for all the cases in one epidemic, and another type for all the cases in another epidemic. Among 273 cases in seven localized epidemics, 41% were influenza A, 16% were influenza B, 1% were A and B mixed, and the remaining 42% represented one or more new types, as yet undescribed.

So plans are under way to prepare experimental vaccines for three influenza types, instead of just one, for next winter's studies.

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War Causes Curtailment

WAR is crippling much of the work in foreign scientific laboratories supported by the Rockefeller Foundation, and has totally wiped out some of the institutions where it was being done, Mr. Fosdick reported. The Foundation has had to close its Paris office, and has moved its Shanghai office to Manila. A temporary office was opened in Lisbon.

Part of Mr. Fosdick's statement reads like the roll-call of an army in retreat: "Our personnel has had to be recalled from Egypt where work was being carried on in malaria and schistosomiasis; from Turkey where we were engaged in sanitary engineering; from Rumania where scarlet fever studies were being conducted; and from Hungary, which was a station for influenza research. However, Foundation personnel is still operating on the Burma Road, in India, in South China, in the Belgian Congo, in Uganda (Central Africa), in Spain and Portugal, and of course in Latin America."

Wherever the Nazi boot has trodden, it has crushed all universities that have resisted *Gleichschaltung*. Their lecture halls have been closed, faculties sent to concentration camps, students imprisoned and many of them shot.

"The condition of university life and standards on the Continent is now little short of appalling. Due to flight, imprisonment or disappearance the number of professors in institutions has been reduced by at least 50 per cent. Jewish professors in France were discharged as a result of the September decrees issued from Vichy, and similar action has been taken in other countries under German domination with the exception of Denmark.

"Similarly in the three Baltic states—Lithuania, Latvia and Estonia — which were absorbed by Russia in June, 1940, the process of converting the universities into Soviet institutions has proceeded rapidly. More than half the professors have been removed from their positions and many of them have been imprisoned or have disappeared."

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First Glances at New Books

HORTICULTURE

DO YOU KNOW YOUR GARDEN? — Gladys M. Goshorn; Decorations by Julian Brazleton—*Oxford Univ. Press,* 310 p., $2.50. A quiz book about gardens and things that grow in them. Each chapter begins with a list of twenty questions, ranging all the way from literary and musical allusions to the botany and entomology of gardens. Some of the questions are veritable "stumpers." The body of the chapter is then given over to paragraphs answering the questions.

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ORNITHOLOGY

MODERN WILDERNESS—William Arthur Babson—*Doubleday, Doran,* 261 p., illus., $3. Easy, informal narratives of experiences out-of-doors, principally with birds, but with some interesting sidelights on the ways of a few mammal species, including *Homo sapiens.*

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GENETICS

ELEMENTS OF GENETICS—Edward C. Colin—*Blakiston,* 386 p., illus., $3. A textbook for college students, presenting compactly but completely the principles of Mendelian genetics. Due attention is given to results of recent researches, such as those of Painter, Muller, Pincus and others. Special emphasis is laid on the application of genetics to problems of human reproduction.

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HORTICULTURE

NUT GROWER'S HANDBOOK—Carroll D. Bush—*Orange Judd,* 189 p., illus., $1.75. A compact, practical handbook for the average farmer who might want to plant a few nut trees. With present-day emphasis on soil conservation and the desirability of farm wood lots, it might not be a bad idea for farmers to plant trees that will yield a food or cash crop as well as wood.

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ENGINEERING

THE ST. LAWRENCE SURVEY, Part II, Shipping Services on the St. Lawrence River—N. R. Danielian, Director—*Govt. Print. Office,* 40 p., illus., 25c. (U. S. Dept. of Commerce)

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GENERAL SCIENCE

SCIENCE ON THE MARCH — John A. Clark, Frederick L. Fitzpatrick and Edith Lillian Smith—*Houghton Mifflin,* 583 p., illus., $1.72. A text for ninth-year pupils comprising units on air, water, food, sun energy, health, universe, weather, natural resources, communication, transportation and reproduction.

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HORTICULTURE

TRY THESE INDOORS, A Handbook of Unusual House Plants—Allen H. Wood, Jr.—*Hale, Cushman & Flint,* 236 p., illus., $1.75. If you want to get away from the monotony of geraniums and begonias, here is a book that will give many practical suggestions, both on interesting plants to grow and on how to take care of them. Although your present attention may be focused on the garden, now is the time to plan for next winter's houseplants, just as last winter was the time for thinking about this spring's garden.

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HORTICULTURE

THE PLANT DOCTOR (Rev. ed.)—Cynthia Westcott—*Stokes,* 297 p., illus., $2. A new edition of a book on the care and diseases with which the home gardener has to contend, and suggestions on how to combat them. The chapters are arranged in order of months, giving a program for the season's work.

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SOIL SCIENCE

ANALYSIS OF UNITED STATES SOILS, Section I: North Atlantic States—J. G. Lipman, J. S. Joffe and Adrienne B. Conybeare—*New Jersey Agricultural Experiment Station,* 35 p., 50c.

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ZOOLOGY

A NEW CEPHALOPOD MOLLUSK COLLECTED ON THE PRESIDENTIAL CRUISE OF 1938—Helen C. Stuart—*Smithsonian Institution,* 6 p., 5c.

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GENERAL SCIENCE

THE ROCKEFELLER FOUNDATION, A Review for 1940—Raymond B. Fosdick—*Rockefeller Foundation, 49 West 49th Street, New York, N. Y.,* 64 p., illus. *Free upon direct application to the foundation.* See page 199.

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ENTOMOLOGY

INSECT PESTS OF FARM, GARDEN, AND ORCHARD (4th ed.) — Leonard Marion Peairs—*Wiley,* 549 p., illus., $4. New edition of a highly successful textbook of economic entomology.

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MEDICINE

MORE YEARS FOR THE ASKING—Peter J. Steincrohn — *Appleton-Century,* 218 p., $2. In the hope of helping people to live out their allotted life span, the author, a physician, tells simply and clearly about the various diseases that threaten life and various things that can be done to avoid or to overcome them.

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ECONOMICS

NATIONAL UNITY AND DISUNITY—George Kingsley Zipf—*Principia,* 408 p., $3.50. The author views the nation as a bio-social organism and finds that a nation is an organic whole, whose further prospering or craven collapse will depend upon its actual handling of the impersonal and personal forces within and outside the nation.

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PHILOSOPHY

THE PROMISE OF SCIENTIFIC HUMANISM TOWARD A UNIFICATION OF SCIENTIFIC, RELIGIOUS, SOCIAL AND ECONOMIC THOUGHT — Oliver L. Reiser — *Oskar Piest,* 364 p., $4. A radically new mode of human thought and orientation must become operative in the future if mankind is to survive. This will be based on non-Aristotelian philosophy. Such is the thesis of the author who is associate professor of philosophy in the University of Pittsburgh. This volume tells how he sees scientific humanism unifying fields of thought which are now often divergent.

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GENERAL SCIENCE—EDUCATION

SCIENCE INSTRUCTION AND AMERICA'S PROBLEMS—*Nat'l. Education Assoc.,* 128 p., illus., 50c. Shop talk by leading science teachers of America, with many suggestions that will be helpful as well to anyone interested in getting science to the people. This is an annual volume, this one based on the 1940 meeting at Milwaukee.

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EDUCATION—ECONOMICS

SAFETY IN THE WORLD OF TODAY—Herbert J. Stack, Don Cash Seaton and Florence Slown Hyde—*Beckley-Cardy,* 372 p., illus., $1.20. A textbook in safety education projects designed to reduce the millions of injuries and thousands of deaths from accidents that afflict the United States each year.

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